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ABSTRACT

This first of a series of reprints from "Soil Conservation Magazine" presents ideas and ways of incorporating environmental and outdoor education into school programs at all levels. This publication contains 10 such reprints. The titles of the articles are: (1) Conservation Education - It Lasts a Lifetime; (2) Through an Open Door; (3) Environmental Education: Homebrew Style; (4) Conservation Campus; (5) Selecting Suitable Sites for Schools; (6) Outdoor Classroom Helps Revive Indian Traditions; (7) Conservation - A Plan for All Seasons; (8) Walk-Up-and-Kick-Um; (9) Experiences Unlimited; and (10) Education that Cannot Wait. Many of these articles are summaries of existing outdoor education programs and how they were developed. One article in particular discusses teacher certification in conservation-outdoor education as proposed in Indiana. (MR)

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Environmental Education In Action

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Conservation education —it lasts a lifetime

by Neal Munch
District conservationist, SCS
Freehold, New Jersey

Do the things children learn in an outdoor classroom really stick with them as adults? Do they influence their attitudes toward the environment in later years?

It has been 10 years since a group of children helped develop the first outdoor classroom in Freehold, New Jersey, and I recently queried those pioneer students about their recollection of the experience.

They are grown now and scattered in all directions—in graduate school, working, or married and living far from Freehold.

The small courtyard at Intermediate School, surrounded on three sides by classrooms and walls, was transformed 10 years ago into a miniature replica of New Jersey's various land forms, complete with native vegetation.

This outdoor classroom has been in continuous use since that time by hundreds of students who have learned how natural resources are interrelated and how people can care for and improve their environment.

Eric Levin, now a graduate student in sociology, has vivid memories of the project. "That was my first exposure to conservation as a science," he said. "For me, the nature area was a starting point of interest in conservation and the environment. I believe that the younger a student can start these kinds of studies, the better."

Among the most perceptive comments were those that came in a letter from David Garrison. After giving credit to Harold Smith, the teacher whose enthusiasm and dedication gave leadership to the original project, Garrison wrote, "The land has become a terribly important part of my life, and no matter what direction my adult career may take I know that I shall never lose my love for the land.

"It always saddens me to realize how shallow some Americans can be in their treatment of the land when at the same time we claim to be an example to all others. I believe . . . it is possible for children (through the use of an outdoor classroom) not only to gain knowledge of the natural world around them but also to gain a real understanding of the personal values needed to live meaningfully and responsibly in that world."

Another student, Cathy Spalholz, now married and living in western Pennsylvania, is using what she learned in her conservation studies to turn her backyard into a nature area. She remembers the trips to gather native plants for the school courtyard and how she and other students waited anxiously for their plants to grow.

One young man remembered that he helped dig the pond. He said that the nature area helped him gain an understanding of New Jersey and its natural resources. Jim Zarnowski also added, "I was a Boy Scout then, and the nature area helped me earn my merit badges."

Stephen Shutzer, a mechanic, commented on the experience of sharing interests and labor with his classmates. "Everyone knew," he wrote, "that it was not a one-person project but that we all had to make it a success. We did it with fun and enthusiasm, and it was one of the few times I did not mind staying after school."

Stephen's younger sister, Cindy, is now making use of the nature area he helped develop. She is one of Mrs. Peggy Dillinger's second grade students.

Mrs. Dillinger encourages the second graders to make use of all their senses. They identify bird calls, walk barefoot on the grass to feel the texture and temperature, smell bayberry leaves, and collect berries, leaves, and ferns which they later use in developing a booklet that helps them identify shapes, colors, and sizes.

The children have become sensitive to other creatures in the environment. When a bullfrog was discovered away from the pond one bitter cold day, the children covered him with grass, hoping to help him survive.

The comments made by the members of that first class seemed to me to show that the students remembered most clearly what they had done with their hands, that it was fun, and that outdoor projects can be the start of a lifelong interest in conservation.

Enthusiastic and dedicated teachers, like Harold Smith and Peggy Dillinger, are the key to a successful outdoor classroom program. And the easy accessibility of the outdoor classroom proved its worth for the opportunities it offered for continuing and day-to-day studies.

(Left) Members of the class that developed the first outdoor classroom in Freehold, New Jersey, 10 years ago. The white pine is representative of native New Jersey plants used in the classroom to help students learn about the state's natural resources.
(Center, left) More members of the "pioneer" class working on a project, and (center, right) 10 years later, Mrs. Peggy Dillinger and some of her students studying pond life in winter at exactly the same place.
(Bottom) Ten years ago, the "pine barrens" area of the school project was just being developed. Today a dense clump of trees in the area is used by all classes at the school to study natural resource relationships.

One of the things learned about outdoor classrooms as the years went by was that overuse can wear out an area so that it loses some of its natural charm. On some sites there must be judicious planning for periods of use.

Also, teachers need to keep in mind an overall objective and hold fast to it, not to stifle ingenuity but to keep enthusiasms from going off in all directions until the environmental studies lose their central purpose, which is giving youngsters the awareness, understanding, and sense of responsibility that will carry over into later years. ♦

Through an open door

by (Mrs.) Helen Patterson
Teacher, Dodson Elementary School
Hermitage, Tennessee

I teach 32 lively fourth graders. Sometimes, when I say, "Let's go to the nature trail," I feel like a magician who has cast a spell.

Dodson Elementary School is nestled in the rolling hills near Nashville, Tennessee. The school site covers 15 acres. When the school was built, planners had the foresight not to denude the entire area. Land not actually required for buildings and recreation use was left in its natural state, and there we have our nature trail.

Our nature trail is self-guiding. Signs, which are excellent tools for teaching language arts, give

information about animal habitats, kinds of soil, rocks, trees, and wildflowers. At one place we have some old stumps set around the edge of a mulched area. That is our outdoor classroom.

This area, where students can gather, provides endless learning experiences. One of our favorites is to sit quietly with eyes closed for a short time and listen. The students then list the sounds they heard and compare notes. Each time we do this, the students become more and more aware of sounds. The end result has been that the children have become better listeners in indoor classrooms.

For an art lesson, all that is needed is some paper, pokeberries, and a few wildflowers. A stump serves nicely as an easel. The children furnish the imagination, and their finished products represent individual interpretations—in vivid colors.

One day last spring we decided to organize a band. Hollow logs became drums for the rhythm section; rocks served as cymbals; and blades of grass worked like a comb to carry the melody. And so the Patterson Hillbilly Band was organized. As one boy put it, "We sure do come up with some groovy sounds."

On occasion, we take the autoharp or a guitar to the outdoor classroom, and the children compose new lyrics for familiar melodies.

One day we had the word "erosion" in a reading lesson, and one of the children kept stumbling over it. Another student tried to explain the word, and finally said, "Let's go show him." And indeed we found erosion on the schoolyard.

A discussion of ways to remedy the problem followed, and then we launched a project to control the erosion. So we had a conservation lesson that grew naturally out of a textbook lesson.

The children are eager learners in our outdoor math class. Using the body as a standard for measuring, they learn to estimate the height of trees, telephone poles, and the school building. They estimate distances and learn to pace off yardage, which gives them an idea of the size of an acre of land as well as of many other concepts dealing with measurement.

Concepts taught in science and social studies are better taught "where the action is." We have compared insect activities with human occupations. The lighting experts are lightning bugs or fireflies; masons are dirt daubers; papermakers are wasps; and chefs are honeybees. Nurses are compared to ants caring for eggs, and the garbage men are beetles.

Children are more expressive in creative activities when they are out in the open spaces. Dances, folk games, and Indian games become more fun. The children often dramatize stories using natural materials, and they create adventure stories and poems about their trips to the nature trail. Often the animals they observe are the subjects.

Last year when a field trip was canceled because of a shortage of busses, the children planned an all-day "field trip" on the school site, complete with a picnic. Most of the children said it was the best field trip they had ever had.

At Dodson, we believe that our outdoor classroom can be a source of enrichment in every subject, and our goal is to guide the students in becoming aware of their environment and to instill in them a desire to use resources wisely. ♦

(Left) Soil formation studies begin with a discussion of rocks as parent material during a class in Dodson Elementary School's outdoor learning area.

(Right) Pokeberries and other natural materials are used to create designs and pictures by fourth graders.

Environmental education: homebrew

In Billings, Montana, we don't need to hold our breath, wondering if our environmental education program will be federally funded again—it never has been.

We've got a homebrew program here, locally developed, locally staffed, cooperatively run by Eastern Montana College and the school district, and supported entirely by local funds, mostly raised by the Parent-Teacher Associations and students.

From a small start, 30 sixth-grade children in the spring of 1967, the program has grown immensely. All of the 1,650 sixth-grade children in Billings, including those from four parochial elementary schools, participated in the program in the spring of 1973. The program also involved about 240 college students in various credit-bearing contributions.

Our environmental education program is like the proverbial oak tree that grew steadily from a small acorn. As our program grew it developed wide roots of support and service from many sources.

Today, the sixth graders have a month of intensive in-school and on-the-schoolgrounds instruction in and experience with environmental investigations and studies. The frosting on the cake is 2½ days at a rented camp in the Beartooth Mountains, in groups of about 200.

At the camp the children get about 10 hours of intensive "hands on" field studies in four areas: aquatic and terrestrial ecosystems; geologic and geographic studies; plot studies, in which a small plot of ground is intensively analyzed; and wildlife ecology. The children can apply some of the special skills learned and practiced in the pre-camp session.

During their stay at camp, the children also have some campcraft instruction, supervised sports in their free time, opportunities to do artwork using native materials, first aid instruction, and dramatic, musical, and inspirational activities.

The pre-camp instruction and the field studies at camp were all carried out last spring by a group of 21 college men and women who in the winter quarter had taken the 3-credit course, "Instructor Training in Environmental Education." Next, in spring quarter they were enrolled in a 14-credit block—8 credits for their 3 or 4 hours per day of working in the schools with the sixth graders during April, and going to camp for the full month of May as the primary field instructors.

The camping skills and sports activities were the province of other specially trained students from Eastern, and art students from the college assisted with the creative projects.

To meet the problem of supervising the children on a 24-hour basis while they were at camp, 180 college students who had taken a 3-credit course in camp counselor training worked as camp counselors.

During the college's spring quarter, the "Environmental Workshop for Teachers" was offered for the eighth time in the last 5 years. It's a 3-credit course for all elementary teachers, covering the philosophy of the program and introducing teachers through actual experience to some of the major instructional units. For its conclusion, the course runs the teachers through the full field program at the camp so that they know what the children will be experiencing. All sixth grade teachers accompany their students to the camp.

In addition to the workshop, teachers use a curriculum guide, "Exploring the World." The guide, written and printed locally and now in its second edition, has been expanded from 28 instructional units to 82 units that cover not only ecological studies but also math, art, and social studies.

From the beginning, the medical community in Billings has provided a physician in residence at each camp session who not only looks after the children's physical needs but also teaches them basic first aid.

Since the first session, PTA financial support has increased. Each year, program staff people visit PTA meetings with a tape-slide story of the camp program. And the schoolchildren have devised their own fund raising activities that also serve as learning experiences. These include hot dog lunches, selling doughnuts and coffee during elections, and selling "spook insurance" in their own neighborhoods just before Halloween.

Although faculty volunteers from Eastern Montana College ran the program for the first 5 years, the members of the local school board and the public school administrative staff were always consulted and kept informed.

In the summer of 1971, the Billings School Board accepted total responsibility for the camp program, and added Ed Heiser, a former sixth grade teacher and school principal, to the administrative staff as Environmental Education Coordinator. The college agreed to continue its in-service teacher training workshops and to recruit and train college students so necessary to the program. This arrangement has worked to the mutual benefit of the children, the college students, and the teachers.

In February 1972, Eastern Montana College was 1 of 10 colleges to win a Distinguished Achievement Award from the American Association of Colleges for Teacher Education. Eastern's was the only award-winning program that dealt with environmental education.

What have really been the ingredients that accounted for the success of the program? There are several:

(1) The program is multidisciplinary, with a sound educational philosophy much influenced by the solid thinking of Dr. William Stapp of the University of Michigan. The goals are, briefly, to help children learn about their total environment—biological, physical, social, cultural, and economic; to become skillful in analyzing and discovering through investigation and experiment the significant aspects of a problem; to become sensitive to their own responsibility toward maintaining a productive and livable environment; and to become motivated to work constructively toward the solution of environmental problems.

(2) The program has a solid foundation of support from parents and the professional community of Billings.

(3) The program directors worked with and within the school administrative structure to gain the respect, cooperation, and full support of the administrators.

(4) The program directors at the outset decided not to solicit federal or state funds, feeling that the program, if it proved itself, would engender local financial support. This faith has been justified.

(5) The program grew slowly because it did not depend on federal grant money that could provide an elaborate start and then possibly a quick fadeout when the federal dollars were gone. It expanded gradually as its local support base and acceptance grew.

(6) The program had the broad basic support of the college administration, although no financial support was sought or received.

(7) The program had the dedication of a few skilled college faculty members who have continually given their time and talent without compensation.

(8) And finally, and perhaps most importantly, the program is basically sound, practical, and concrete, and generally sells itself to creative and dynamic teachers and principals who see in it a way of making the educational process more valuable and more exciting to students. ♦

style by Dr. Wilson F. Clark
Chairman, Division of Science & Mathematics Eastern Montana College Billings, Montana

Conservation campus

by James E. Callahan
RC&D project coordinator, SCS
Mount Vernon, Missouri

Schools, including colleges and universities, in many places are turning their grounds and campuses into environmental learning areas with help from resource conservation and development (RC&D) projects.

RC&D projects are administered by the Soil Conservation Service for the U.S. Department of Agriculture. They are designed to help local people improve the social and economic conditions in the project area by developing and utilizing to the fullest extent the area's resources.

RC&D project leaders throughout the country are recognizing schools as important community resources.

At Missouri Southern State College, near Joplin, college administrators, RC&D officials, faculty members, and students had a part in developing a campus conservation plan to protect natural resources on the 310-acre campus and at the same time offer firsthand conservation learning opportunities for 3,200 students.

The conservation plan has brought about many improvements. For example, water runoff from roofs and parking lots that once cut gullies down a steep bluff flanking many of the campus buildings is now intercepted and diverted into a grassed waterway that safely carries it into nearby Turkey Creek. And eroding banks along the creek have been turned into wildlife management areas by planting soil-holding trees and shrubs that also serve as food and shelter for wildlife. Other critically eroding areas have been seeded to 'Emerald' crownvetch and fescue.

Because the campus occupies almost the entire land area of a small watershed, students, as well as teachers who are enrolled in environmental education summer workshops, can study watershed resource management right on their own campus.

A unique study area that includes a half-acre spring-fed, cold-water pond, which slowly overflows into a 5-acre warm-water marsh, also provides opportunities for on-campus studies of plants and animals native to the cold- and warm-water habitats of southwestern Missouri.

The pond was once a spring-fed swimming pool on the estate of Frank Carmany Wallower, an early pioneer in the lead and zinc mining industry in Missouri. By the time the college acquired the estate, undercurrents from the spring had created "blow outs" beneath the abandoned swimming pool, blocking the water flow and creating erosion problems and dangerous swampy areas. Furthermore, according to Dr. Leon Billingsly, president of MSSC, "the old pool was polluted and a blemish on our new campus."

Igneous, sedimentary, and metamorphic rocks will be placed around the pond to stabilize the banks and outlet and to provide opportunities for geological studies. A border planting of trees and shrubs around the pond and marsh will eventually help abate wind and noise. The effectiveness of these windbreaks will be determined and measured over the years by MSSC students.

The pond area alone is "invaluable," according to Dr. Gerald Elick, assistant professor of biology. "It is an ever-present teaching aid within a few hundred

(Left) They start young to learn about conservation on the Missouri Southern College campus where SCS helped develop a conservation plan that includes many study sites for future teachers, biology and geology students, and the entire community.
(Below) Biology students gather laboratory specimens from a pond developed near the site of an abandoned swimming pool on the Missouri Southern campus. The conservation learning area on the campus was developed with help from RC&D project leaders.

feet of every classroom on campus."

Technical help in developing and implementing the campus conservation plan was provided through the Southwest Missouri RC&D Project by the Soil Conservation Service, the Jasper County Soil and Water Conservation District with which the college is a cooperator, the Missouri Department of Conservation, and the Missouri Extension Service.

Helping schools and colleges tie together sound land use and educational opportunities brings RC&D project leaders closer to the goal of properly developing, utilizing, and conserving the natural resources of their area for the benefit of the people. ♦

Selecting suitable sites for schools

by Ron Estepp
Soil scientist, SCS
Moorefield, West Virginia

Whatever the school needs of a community may be, in too many instances sites for new schools are chosen and the buildings completed without any thought being given to what lies just inches beneath the surface, or without considering what effects surface water runoff and drainage patterns will have on parking lots, basements, playgrounds, and athletic fields.

School administrators in Jefferson County, West Virginia, found the help they needed in avoiding school site problems when the Eastern Panhandle Soil Conservation District offered its services in selecting sites for four new schools.

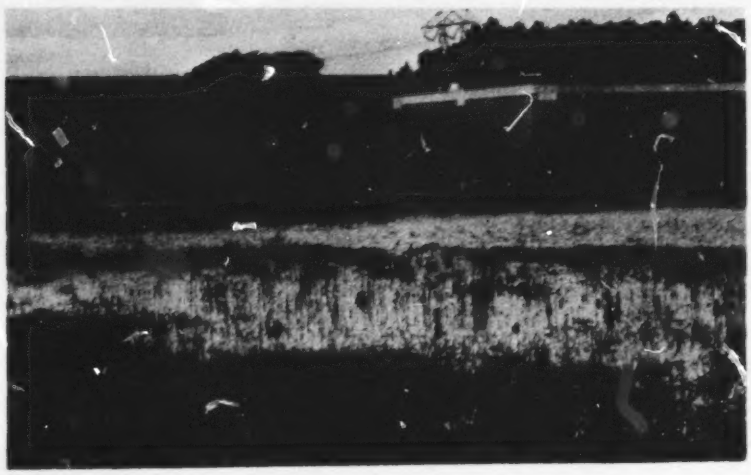
The Soil Conservation Service provided soil reports and helped with needed onsite inventories of the natural resources.

Site selection problems are compounded for educators. Not only must they look for favorable soil conditions, they must also consider geographic and demographic factors and costs.

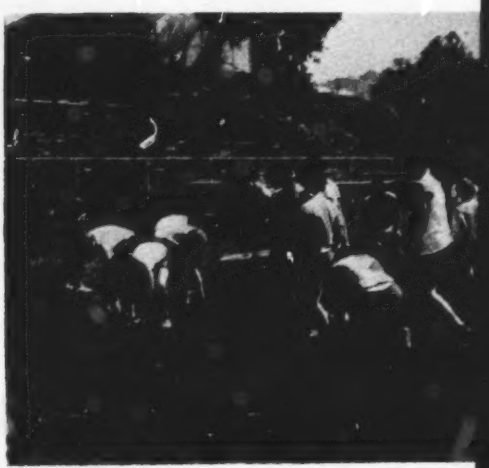
Harold Pickens, Superintendent of Schools in Jefferson County, explained, "We pick three or four possible sites for each school on the basis of location, density, and projected growth of population. We also consider transportation, esthetics, size, and costs. The architect then considers such factors as soil reports before the final site is selected."

Many counties in West Virginia approach school site selection in somewhat the same manner. In Mason County, the Board of Education had considered four possible sites for two new schools. Before making the final selections, the Assistant Superintendent of Schools and an SCS soil scientist evaluated each site. One site was quickly eliminated because of drainage problems. The final selection of two suitable sites was made after a thorough investigation of potential soil and water problems.

Soil scientists can spot potential trouble areas that are not readily visible to the untrained eye. For example, a seasonal high water table is common in many areas, but during dry summer months there may be no evidence of problems. The soil scientist



Soil information available to school boards and administrators in every community can help identify potential problem areas that may result in flood or drainage damage to schools after construction is completed.



Physical education classes combine exercise and conservation by picking up large rocks in preparation for shaping and seeding the area to soil-holding grasses.

looks for signs of mottling, which tell him that during wet months, as the water table rises, there will likely be wet basements and wet or ponded play areas.

Depth to bedrock and types of bedrock are other important factors to consider in avoiding potential trouble and expense. Excavation and construction costs can increase considerably if the bedrock is near the surface.

Costs can also increase if the selected site is steep and needs to be leveled. In some instances, schools have bypassed steep sites for level flood plains where construction is easier and cheaper, but one hazard has simply been replaced by another.

Soil scientists can also pinpoint erosion hazards and suggest precautionary measures. They can determine whether or not a site is susceptible to land slips, and they can check the soil permeability, which is critical in onsite sewage disposal. By knowing about the soil, costly mistakes and health hazards can be avoided.

A good way to save money in developing school sites is to plan measures for controlling surface water runoff before construction begins. And it is much cheaper to install necessary drainage systems during construction than after the buildings have been completed.

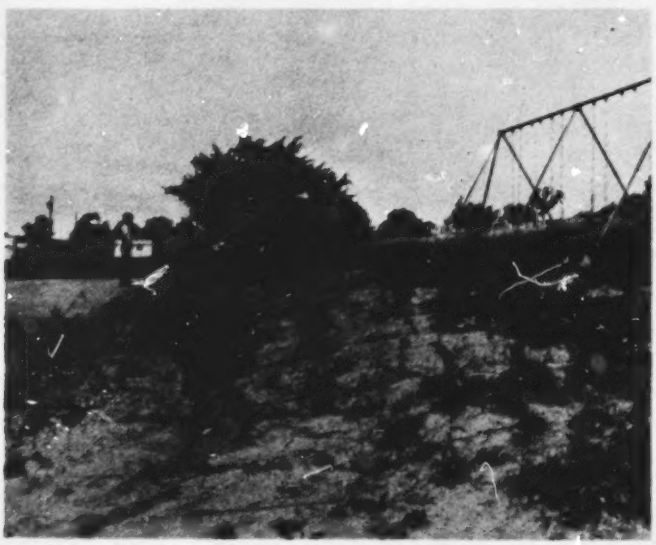
At three locations in West Virginia, the added cost of eliminating surface water after construction came to more than $3,000 for each site. In one place, water draining from a 100-acre watershed ended up on the schoolyard every rainy season because an access road diverted all water onto the school site. The result was a series of small floods that damaged the school building.

In addition to using soil reports in selecting school sites, Jefferson County is using soil information to develop an outdoor conservation classroom on each new site.

"We keep the bulldozers out of the outdoor classrooms," said Superintendent Pickens. "We want to keep those areas in their natural condition."

A learning laboratory developed around a marsh is being planned for the Shepherdstown Elementary School and for students from nearby Shepherd College. The college will use the area to train future teachers in the use of outdoor classrooms for environmental and conservation studies. The plan for the marsh area, developed with the help of SCS, calls for a boardwalk to provide easy access to study areas without damaging the soil and plants.

West Virginia educators are convinced that soil information is essential in selecting school sites. Not only are they able to reduce costs in some instances, but also the students are better served by having outdoor study areas and dry playgrounds. Planning doesn't start with buildings; it starts with the soil that supports them. ♦



Before and after scene at an elementary school in Harrisville, West Virginia, where grass was planted by students to stabilize the soil on a play area slope. The grassed waterway at the edge of the hard-surfaced area carries runoff safely away from the playground.

Outdoor classroom helps revive Indian traditions

by Rose Fleming
Public information specialist, SCS
Jackson, Mississippi

An outdoor classroom for environmental studies is helping to give students at Red Water Elementary School, on Choctaw tribal lands near Carthage, Mississippi, a new pride in their Indian traditions.

Maintaining Indian identity and culture is an important objective at Red Water, according to J. C. Bates, principal of the school.

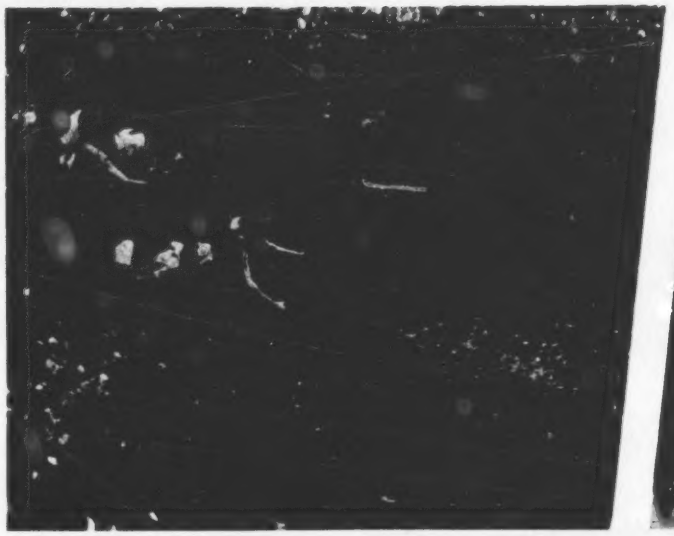
The 240-acre study area on the school site is part of the 8,000 acres of Choctaw land in Mississippi—all that is left now to the Choctaw tribe of the 26 million acres they once controlled.

Through the Leake County Soil and Water Conservation District, Emmett Tynes, SCS district conservationist, and Bob Grigsby, SCS woodland conservationist, at the request of the Tribal Council, are providing technical assistance in developing the school site and in laying out learning trails in cooperation with teachers and students.

Music, art, and use of native materials in craftwork are all included in the outdoor classroom project.

Parents of the students are becoming interested in the project, and many of the older Indians, some in their 80's, have taught the children the Choctaw names of trees and plants.

The outdoor classroom will serve as the setting for some of the traditional Choctaw celebrations that are being revived, and the swamp areas are used by the neighboring Indian community of Bogue Chitto for its annual fall festival.



The Bureau of Indian Affairs, USDI, and the Mississippi Department of Education have from the beginning helped develop the Red Water School outdoor classroom.

Charles Meeley, parent representative on the Follow-Up Program at the school, believes that outdoor classroom studies will encourage children to continue their education and enable them to combine a respect for Indian traditions with an understanding of the use and management of natural resources. ♦

(Top, left) Red Water Creek, two springs, and several swamps and bogs are part of the water ecosystem study area where today can be found the same kind of ducks whose wing bones were used as arrowtips for hunting by the children's forefathers.
(Top, center) Music and dancing is taught in the outdoor classroom at Red Water Elementary School. Students, under close supervision, build campfires and dance around them as their forefathers did. "Traditional music and dances almost had been lost here," said Sue Ellen Morrison, music teacher. "Only one of the six communities making up the Tribal Council had continued to dance the traditional dances. Choctaws who knew these dances taught others, and now they have outdoor festivals."

(Top, right) Students at Red Water School learn to identify trees and other plants by their common name, scientific name, and Choctaw name. Chewing the sap of the "Heiki-Uppe" (sweetgum, or *Liquidambar styraciflua*) is as enjoyable for these youngsters as it was for their ancestors. And the leaves of the "Itle-Homie" (sourwood, or *Oxydendrum arboreum*) can quench their thirst just as they did for the Choctaw long before the white man arrived.
(Bottom) The ancient Choctaw made rabbit hunting sticks from hickory trees. Miss Linda Johns, teacher, and Emmett Tynes, SCS district conservationist, explain to the children how the sticks were made.

Conservation— a plan for all seasons

Outdoor classrooms provide an almost endless variety of conservation learning experiences that can satisfy a child's curiosity about his environment.

Often this curiosity is the best guide to the use of natural resources in developing learning projects that bring about an understanding of the part people play in protecting and managing the environment.

Outdoor classrooms come in all sizes, and they often are perpetually in a state of change, because students year after year plan and develop their own projects for the classrooms. Enthusiastic and imaginative teachers, able to build on the curiosity and energy of children, can lead the environmental studies program toward ever-expanding intellectual and perceptual horizons for students.

Outdoor classroom experiences fit into every discipline, encouraging awareness that opens the way for comprehension. And these experiences are the only way that children can become active participants rather than passive spectators in learning how to protect and care for natural resources.

Here are some examples of ways that the curiosity of students and the enthusiasm of teachers and other adults have led to opportunities for real-life learning situations in environmental conservation.

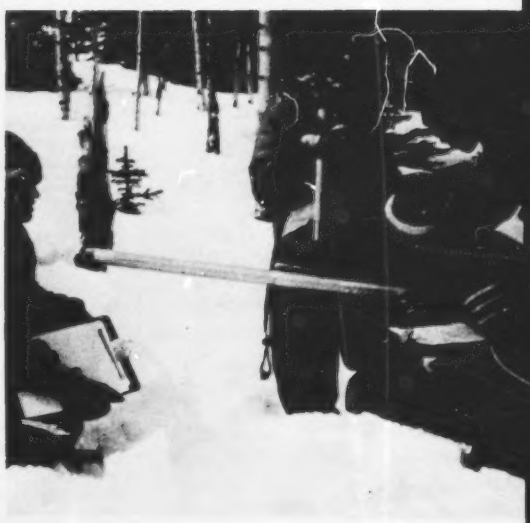
For instance, what started as a small garden on a 10-foot-square flowerbed 3 years ago at Deaf Smith Elementary School in Rosenberg, Texas, is now an outdoor classroom that gives every student a chance to participate in conservation projects.

The flower garden introduced the students to soil and water as the basic resources necessary for plant growth, and it showed them how people can improve and enrich the soil to benefit plants. "They were so interested we couldn't keep them out of the flowerbed, and with 120 fifth graders, the garden was well cared for," said Richard Stadnicki, who was the first teacher to make use of the school site for conservation studies.

Now, each fifth grader has 25 feet of space for his own garden where he can do soil studies, plant flowers and vegetables, observe birds and insects, and share his findings with his classmates. Recently, with the help of the

Information for this article was furnished by SCSers Roy Hauger, Bennie Billington, Robert Keller, and Mickey Black, Texas; J. B. Earle and Gene Warren, Louisiana; Joe Covington and Watson Lawrence, North Carolina; Duane Bosworth, Oregon; and Lyle Tregaskis, Alpine School District, Utah. It was compiled by Kay Mergen, Information Division, Washington, D.C.

(Left) The edge of a pond proves to be a good hunting ground for specimens for a water ecosystem study by these Indiana students. (Left, center) Planting seedlings is part of the outdoor classroom project at Deaf Smith Elementary School, Rosenberg, Texas. (Photograph courtesy of *Fort Bend Suburbia*.)
(Right, center) The wildlife in an outdoor classroom brings about varied reactions from the students. (Right) The Alpine School District, near American Fork, Utah, makes use of a mountain camp throughout the year for environmental studies. Here the students are determining the water content of the snowpack.



County Extension Service, a study project on the nutritional values of different food plants has been added.

From New Iberia, Louisiana, comes the story of Park Special Education School for physically and mentally handicapped children where students learned to grow flowers and vegetables.

The New Iberia Women's Club provided materials and helped students with individual projects. Teachers found that students who worked on the garden project were eager to know more about how plants grow, how soil and water help plants to grow, and how the gardens could be improved.

When Mrs. Nina Parker, science teacher at Central Junior High School in Gatesville, North Carolina, decided that the best biology laboratory was the outdoors, she called on the Soil Conservation Service to help with a pond.

This project resulted in a cooperative agreement between the Gates County Board of Education and the Gates Soil and Water Conservation District. Now there is a conservation plan for the entire school site, and teachers and students are developing a variety of ecological and conservation studies.

Plants for the project were provided by the North Carolina Wildlife Resources Commission. A landowner donated the use of adjoining property for a learning trail. Now completed, with a pinebark mulch to protect the soil, the trail is being used by the entire school for many kinds of studies.

Student concern for erosion on the school grounds led to an outdoor classroom for Brownfield Elementary School near Baton Rouge, Louisiana. By the time the erosion was under control through proper soil preparation and seeding, the students were into tree planting. Last spring the entire community was invited to a conservation demonstration by students to show how they had developed their own study projects as well as improved the schoolyard.

At the close of the program, the outdoor classroom was dedicated to Marshall Hough, the SCS district conservationist who helped develop the conservation plan for the 5-acre school site.

Still another idea is being tried in Pampa, Texas. There the public school system is working to bring a wide variety of conservation experiences to the students.

A series of outdoor laboratories are planned at different schools, each emphasizing some aspect of ecological and conservation studies. Students will visit each school to supplement studies going on at their own school.

Mickey Black, the SCS district conservationist, is working with

Dr. James F. Malone, school superintendent; Jerry Cronister, coordinator of elementary education; and with teachers and students at each of the schools in developing the school sites.

The outdoor laboratory now in use at Pampa's Horace Mann Elementary School was designed to emphasize ecological relationships, the influence of seasonal changes, and wildlife habitat studies.

Another Pampa school, the Robert E. Lee Junior High School, is developing an area for the study of soil erosion problems by constructing banks of earth to show the influence of slope on erosion, and students have planted test-plots using 20 different grasses to observe the soil-holding properties of each. Gray County Soil and Water Conservation District furnished the grass seed.

Dr. Malone considers outdoor projects particularly significant to the High Plains area, "So much of our lives is related to the outdoors here," he said.

In Utah, conservation studies go on year-round in the Alpine School District, which owns a camp at the 8,000-foot level in the mountains. During winter, students carry on a variety of studies, including learning how to determine the water content of the snowpack and to estimate the amount of water that will be available to farms and cities in the valley below that depend on snow for their water supply.

In summer, fifth graders in the district spend a week at the camp studying resources of the mountain environment. One of the highlights is a visit from a local sheepherder who explains his problems in protecting his flock from predators.

Elementary schools in the Alpine district invite ninth grade science students from a nearby high school to help elementary students with environmental studies. Teachers develop objectives and worksheets for the ninth graders who are briefed before each project. This program not only gives elementary students more individual attention than could be provided by one teacher but also is a valuable learning experience for the ninth graders, teachers say.

Throughout the nation, similar outdoor learning programs are underway in cities and in rural and suburban schools. In cities, the results of erosion show up in the gutter instead of a stream but are there nevertheless for all to see.

Some schools make use of nearby parks, forests, and nature centers as well as their own schoolyards. School projects have been helped by parents, resource specialists, community leaders, and various organizations.

The opportunities for learning are there in every community. And the need is pressing if young people are to learn where they belong in the effort to protect and manage the environment. ♦

(Above) Curiosity overcomes traditional feminine fear of snakes on the Dodson School Nature Trail, near Nashville, Tennessee. (Below) Managing a vegetable garden proved a significant learning experience for students at the Park School for handicapped children in Louisiana.

"Walk-up-and-kick-um"

by Jan Curtis
Information Division, SCS
Washington, D.C.

Walk-up-and-kick-um may not be the exact Indian pronunciation, but it's how the kids pronounce "Wahkiakum," the name of the school district in southwestern Washington where language arts is only one of the subjects studied in the tall timber and along the sparkling creeks of a 100-acre classroom.

Involvement isn't an Indian word, but it explains how this outdoor classroom was developed by the people of Wahkiakum County in less than 2 years and with only $2,100.

Community involvement began in 1969 when Bob Webb, district conservationist for the Soil Conservation Service in Wahkiakum County, suggested to the school board that 100 acres of school land, then being used only by vocational agriculture students for forestry studies, could be developed into an outdoor classroom for the elementary school and the high school in the small town of Cathlamet. These two schools serve two-thirds of Wahkiakum County.

Webb's idea caught the imagination of school board members; but school district funds were low. Webb believed, however, that the people in the community would be willing to help in planning and developing the outdoor classroom.

He was right. An advisory committee made up of representatives from the state Department of Natural Resources, Crown Zellerbach (the major lumbering industry in the county), the state Department of Game, and the Wahkiakum Soil and Water Conservation District enthusiastically joined with school officials and teachers in preparing a plan for developing the 100-acre classroom.

Then, with backing from citizens, faculty, and the school board, and with a $1,800 federal grant from the Cowlitz-Wahkiakum In-Service Education Center and $300 from the state Soil and Water Conservation Committee, the project was ready to go beyond the planning stage.

Vocational agriculture students cut, sawed, split, hammered, and nailed and brought an Indian longhouse into existence for use during inclement weather. Crown Zellerbach donated the cedar logs, and elementary students, through research, furnished the design for the longhouse.

The Department of Natural Resources set up two outdoor restrooms near the longhouse and donated the sign that marks the entrance to the 100-acre classroom.

The nearby Clark-Skamania Soil and Water Conservation District loaned its trail-building machine to the vocational agriculture students for use in constructing four loop trails. The vo-ag students also helped dig soil-profile study pits, construct a series of ponds for water studies, and prepare a resource inventory map of the site. And they supervised a general cleanup of the area after construction was finished.

The vo-ag students and their teacher, Robert Kerstetter, and the Future Farmers of America chapter are given much of the credit for the development of the classroom. Fred Beck, science teacher at Wahkiakum High School and coordinator of the outdoor classroom activities, claims that their work and cooperation brought the outdoor education program into full swing years sooner than expected.

Pre-schoolers and first graders use a scaled-down version of the 100-acre classroom—a minitrail next to the school buildings. The trail leads through a strip of trees 150 feet wide, past a soil-profile study pit, and along a creek.

The mini trail is also popular with second graders, who are encouraged to use their imaginations as well as their textbooks in identifying plants. Such names as "hairy fan" for ferns, "stickly bush" for holly, and "Mr. and Mrs. Pointer" for fir cones show up in their creative writing.

Creative writers in one of the third grade classes wrote a poem about "Father Fir," the giant 500-year-old tree that stands in the center of the outdoor classroom. The poem tells how Father Fir's children and grandchildren are growing up around him on land formerly used for pasture. The music teacher set the poem to music.

Fifth graders use the outdoor classroom for environmental studies. They do creative writing and research papers, and they draw outdoor scenes using materials found on the ground as their art supplies.

Sixth, seventh, and eighth graders make use of the outdoor classroom through comprehensive science programs.

High school biology classes use the classroom as an open-air laboratory for water, animal, and plant studies. The students undertake an individual study of biotic communities. Each student ropes off his own area, studies it thoroughly for 5 or 6 days, and concludes his studies with a research paper.

The FAA chapter makes wood products as part of a timber management and money-making effort. These students have taken on the continuous task of clearing salmon berries and other undergrowth from the trail system.

One of the four trails in the outdoor classroom leads through mature timber and along a major stream that forms the classroom's northwest boundary. A second trail leads from the longhouse to a fishpond. A third features "Father Fir," a shallow pond, and an outdoor "living room"—a small secluded clearing that has soft, green, moss-covered "sofas" and "chairs." A fourth trail leads through an area where students have planted 2,500 trees in the past 15 years.

Community involvement in the classroom is still strong. Resource specialists in the area conduct a yearly "conservation day" for students, with sessions on soil conservation, fire fighting, and tree diseases.

The advisory committee, with Mrs. Norma Artiz, a third grade teacher, as chairman, is working with all the teachers and students in planning ways of using the outdoor classroom more fully. Four students now serve on the committee.

For its leadership in the outdoor classroom project, the Board of Directors of Wahkiakum School District 200 was named one of 12 regional first-place winners in the 1971 National School Board Awards. The $500 cash award will be used to further develop the outdoor program.

Wahkiakum is Indian for "tall timber," a good description of the place where Chief Wahkiakum and his Cathlamet people once lived, and where today students are learning what it means to live in harmony with nature. ♦

The objective of the Wahkiakum outdoor classroom in Cathlamet is poetically stated on the sign (opposite page) at the entrance to the 100-acre classroom.
(Above, left) The students cut their own trails in the outdoor classroom, using a "trail maker."
(Above) The trails and study areas are used by both elementary school and high school students.
(Left) These third graders are releasing tadpoles into a stream.

Experiences unlimited

by Joe E. Wright
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Indiana Department of Public Instruction
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An 11-year-old boy shouts "Snake!" And the group of sixth graders and their teacher stop in their tracks. Silently they watch the snake wiggle away into the underbrush.

Then follows an excited discussion. Where does the snake live? What does it eat? Does something eat the snake?

Farther down the trail, a boy points to an old rotting log. Teacher and students gather around the log, looking at the moss, several kinds of fungi, and some scurrying bugs.

Two boys flip the log over. "Wow! Look at all those things," says an excited girl, sighting snails, earthworms, ants, termites, salamanders, and many other small creatures.

The group spends about 30 minutes here, asking questions and discussing this small ecosystem. Photosynthesis, decomposition, nitrogen cycles, energy transfer, and soil enrichment all enter into the discussion.

The group, seeing, touching, and smelling, is experiencing something that cannot be duplicated in a classroom. And the teacher reflects the enthusiasm of the students. She has become a participant rather than a lecturer.

This group of sixth graders from Bartholomew Consolidated School near Columbus, Indiana, is typical of several that now have an opportunity to use outdoor classrooms to enrich the school curriculum. Indiana educators are finding that such experiences in a natural environment can help

These fifth graders (below, left) chose "gully plugging" as their conservation action project. Plant identification (center left) opens the door to many environmental learning experiences—soil-plant relationships, insects and birds that feed on plants, seed dispersal adaptation of plants, and animal

students to better understand their role as passengers on the spaceship Earth.

Their conservation education program is open-ended and flexible so that individual interests can be pursued. Many students are "turning on" to education because of their experiences in the outdoor classroom. They are motivated to read more, to write, and to discuss in class their encounters with the natural environment.

In an outdoor learning program, an informal outdoor environment replaces the formal classroom. Outdoor experiences complement the school curriculum by continuing the educational process that sometimes is limited both physically and mentally by chairs, desks, and four walls.

The program encourages practical application of knowledge gained in the classroom and helps to develop conceptual thinking by introducing problem-solving and self-discovery experiences.

In the outdoor classroom, verbal and abstract "indoor learning" comes alive through real experiences. The vicarious world of books is enhanced and enriched by a world of real things.

Many educators who feel that contemporary curriculum leans too heavily toward the abstract believe that outdoor classrooms can be styled to provide the variety of concrete learning experiences needed by children.

As one teacher put it, "One experience is worth 1,000 pictures." What are we waiting for? ♦

populations that live in the soil beneath plants. These students (center right) are studying the decomposers that are breaking down a fallen tree and returning it to the soil where it will furnish nutrients for new plants and humus for the soil. (Right) There are many things to observe and study along a woodland trail.

"Education that cannot wait"

by Dr. Clyde W. Hibbs
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Environmental education is characterized by S. P. Marland, U.S. Commissioner of Education, as "Education that cannot wait."

The quality of our environment has become a matter of serious national concern. And the big question now facing educators whose responsibilities include the preparation of future teachers is what strategy will be most effective in accomplishing environmental education goals.

During the past 30 years, many conservation education programs have relied on workshops for in-service teachers. Such training is valuable and necessary, but a more fruitful area might be greater emphasis on the quality of environmental education experiences provided for future teachers.

In designing curricula for pre-service teachers, emphasis should be placed on (1) developing an awareness of environmental problems and the role of teachers in improving the environment; (2) providing a basic understanding of scientific and socioeconomic aspects of the ecosystem; and (3) motivating action toward improving the quality of environment and equipping teachers to work effectively in achieving this goal.

This training can be achieved in varying degrees through the three components now existing in teacher education experience —general education, subject area specialization which includes environmental understandings, and the professional preparation for a teaching career.

Providing an environmentally relevant adisciplinary general education program will require major restructuring of existing courses or developing new ones in many colleges. Admittedly it is difficult for a faculty with discipline orientations to develop and teach adisciplinary courses. But unless this is accomplished, the general studies component of teacher training can become an aggregation of existing courses, often with questionable relevance to man-environment problems.

This difficulty is equally true in the area of subject specialization. Not only will it be necessary to restructure existing courses and develop new ones, but a special effort to interrelate and focus various disciplines on environmental problems will be required. This can be accomplished by faculty members having an adisciplinary orientation, by team teaching, through interdepartmental seminars, or by other appropriate methods.

The professional education component warrants special consideration if tomorrow's teachers are to be environmental educators. Throughout the undergraduate experience, general education, subject area specialization, and professional education should be skillfully integrated in complementary fashion.

Those entering the teaching profession should realize that environmental challenges require an effective kindergarten to twelfth grade educational program in all subject areas. They should also understand the unique and important opportunities that will be theirs in helping determine the quality of man's environment.

Beginning in their freshman year, prospective teachers should participate in a carefully planned series of experiences designed to achieve environmental education objectives.

The introductory course should include (1) the interrelationships of the various earth components —minerals, air, water, soil, plants, animals, and human resources; (2) the relationship between various disciplines and environmental studies; and (3) consideration of contemporary environmental problems, their causes, effects, and possible solutions.

Subsequently, students should have an opportunity to explore environmental components in depth through course work, participating in practicums and other types of internships, engaging in various types of environmental encounters, and associating with

competent and dynamic environmental educators.

Also, they should have the opportunity to learn how to integrate environmental understandings into teaching-learning experiences.

To accomplish the environmental education objectives there must be a high degree of involvement on the part of the student with professional conservationists, decision makers, resource agencies and environmental organizations, and professional educators. To be successful in this area, the teacher will not be able to accept the status quo without critical evaluation. Innovation and creativity will inevitably find expression as those in environmental leadership roles interact frequently with the educational milieu.

Developing a pattern for teacher certification for environmental education may serve as an effective way of motivating teachers to become better prepared in environmental studies. The method of achieving certification, however, and the criteria may differ among states and educational institutions. A number of states have recently expressed interest in certifying teachers in this area, and teacher certification patterns already exist in a few states.

The Teacher Certification Committee of the Conservation-Outdoor Education Association of Indiana, Inc., has recently submitted a certification proposal to the Division of Teacher Education and Certification, State Department of Public Instruction. The proposal is for certification in environmental conservation for a teaching minor and major at the undergraduate level and for a coordinator in this area at the graduate level

Because of space limitations, only the recommendations for the teaching minor and major are listed here. A teaching minor in environmental conservation that would relate closely to and provide support for a variety of teaching majors should be the first step in teacher certification in environmental studies.

Nothing can be more important, over the long run, in achieving environmental quality than the improvement of the quality of education in this area for future teachers. Herein lies a unique challenge and great opportunity for colleges and universities everywhere. ♦

Recommendations for Teacher Certification in Environmental Conservation

Minimum of one course to be completed from each of the following groups:	**Teaching minor—Semester hours**	**Teaching major—Semester hours**
Introduction to Natural Resources. To include: (1) interrelationships of minerals, air, water, soil, plants, animals, outdoor recreation, and human resources; (2) the relationship of the various disciplines to environmental conservation; and (3) consideration of contemporary environmental problems.	3	3
Biological Sciences. To include ecological relationships.	3–9	3–9
Earth Sciences	3–9	3–9
Physical Sciences	—	3–9
Economics, Political Science, and Sociology. To include a study of population and demography.	3–9	3–12
Special Resource Areas. To include basic resource areas, outdoor recreation, and resource management.	3–9	3–12
Methods of Teaching Environmental Conservation	3	3
Electives in Environmental Conservation. To include urban and regional studies.	0–6	0–12
Total	24	40